



**FEDERATION EUROPEENNE DE LA MANUTENTION  
SECTION II  
CONTINUOUS HANDLING**

**FEM  
2 564**

**QUESTIONNAIRE AND CHECK-LIST FOR THE STUDY  
OF CONTINUOUS BULK HANDLING SYSTEMS**

***silos, hoppers and bins - specific part***

*original F*  
edition E  
April 1994

**INTRODUCTION**

This specific part should be used in conjunction with document FEM 2 561 (April 1994 : Questionnaire for the study of continuous bulk handling systems - Problems common to mechanical handling, pneumatic handling and silo storage.

This questionnaire concerns storage equipment (silos, hoppers and bins) and surrounding equipment, loading and unloading equipment, and auxiliary equipment, which are to be built as individual or complex systems. It covers the design, manufacturing, assembly and commissioning stages.

It does not cover the following equipment :

- concrete silos,
- mobile storage equipment used for transportation, such as road vehicles, railway wagons, bulk material containers, ships and barges,
- boxes and bins for transport and pressure vessels used in pneumatic handling systems,
- stocks and pile storage.

**CONTENTS**

**1 - SUMMARY OF THE CONTENTS OF THE QUESTIONNAIRE FEM 2 561 OF APRIL 1994 "PROBLEMS COMMON TO MECHANICAL HANDLING, PNEUMATIC HANDLING AND SILO STORAGE" :**

- 1.0 introduction
- 1.1 project designation
- 1.2 data on the bulk material to be conveyed
- 1.3 operational data
- 1.4 system configuration
- 1.5 electrical general characteristics
- 1.6 Data on control and automation
- 1.7 auxiliary services

**2 - QUESTIONNAIRE "SPECIFIC PART" :**

- 2.1 specific characteristics of bulk materials and their influence on the design of storage equipment (silos, hoppers and bins)
- 2.2 special requirement related to design, construction and maintenance
- 2.3 specific environmental requirements

**3 - CHECK-LIST :**

- 3.1 additional questions regarding the definition of the technical handling problem
- 3.2 specific installation requirements
- 3.3 interfaces and connecting conditions
- 3.4 supply limits

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## 2 - QUESTIONNAIRE 'SPECIFIC PART'

### 2.1 Specific characteristics of bulk materials and their influence on the design of storage equipment (silos, hoppers and bins)

The precise and fullest possible knowledge of the bulk materials characteristics is essential to define and select the storage, loading and unloading equipment and/or system. This implies close cooperation between the manufacturer and user to collect relevant information. The following documents are helpful to seek basic information.

- documents relative to storage

- . FEM 2 581/2 582 : general properties of bulk materials and their symbolization
- . FEM 2 551 : pressure release of dust explosions (see VDI 3673)
- . FEM 2 381 : specific characteristics of bulk products as applicable to storage in silos
- . FEM 2 321 : influence of the characteristics of bulk materials on the design and dimensioning of silos

- documents relative to loading and unloading equipment

- . FEM 2 181 : specific characteristics of bulk materials as applicable when handled mechanically
- . FEM 2 123 : influence of the characteristics of bulk materials on the design of bucket elevators
- . FEM 2 124 : influence of the characteristics of bulk materials on the design of troughed belt conveyors
- . FEM 2 125 : influence of the characteristics of bulk materials on the design of horizontal and slightly inclined screw conveyors
- . FEM 2 126 : influence of the characteristics of bulk materials on the design of en-masse conveyors/elevators
- . FEM 2 127 : influence of the characteristics of bulk materials on the design of vibrating conveyors

### 2.2 Special requirements related to design, construction and maintenance

	YES	NO
- does the bulk material manufacturing process require special design and/or technology to resolve the following functions ? If so, which one ?		
. silo geometry .....	.....	.....
.....		
. silo loading (filling) .....	.....	.....
.....		
- special case of pneumatic loading :		
. speed : .....		
. pressure : .....		
. type of gas : .....		